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Case Report

Treatment of Extensive Urethral Hemangioma With KTP/532 Laser

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Background and Objective: **Urethral hemangiomas are rare. They vary in size from pinpoint masses to extensive honeycomb-shape deformities leading to significant hematuria. For extensive lesions, therapeutic options have included extensive surgical resection and reconstruction or multistaged neodymium:yttrium-aluminum-garnet (Nd:YAG) laser photocoagulation. We report our experience with the use of potassium titanyl phosphate (KTP/532) laser for treatment of the extensive form.**

Study Design/Materials and Methods: **A 7-year-old boy presented with a 2-week history of urethral bleeding. He had extensive hemangiomas of the genital and perineal regions. Cystourethroscopy disclosed diffusely scattered honeycomb-shape hemangiomatous malformation of the anterior urethra. KTP/532 laser energy was delivered transurethrally to the hemangiomatous areas until they blanched.**

Results: **The Foley catheter was removed 24 hours postoperatively, and the patient voided clear urine without difficulty. He has remained trouble-free for more than 2 years.**

Conclusion: **Judicious endoscopic single-stage therapy with KTP/532 laser may obviate open surgical intervention in most cases of extensive and symptomatic urethral hemangiomas. In view of our observation and the literature, KTP/532 laser therapy should be considered the first line of treatment.**

Key words: laser therapy, urethra, vascular malformation

INTRODUCTION

Hemangiomas are benign vascular tumors. The lesions are not common in the genitourinary tract and rarely occur in the urethra. Various treatment options have included electrocoagulation, arterial embolization, local radium implantation, and surgical excision [1–9]. More recently, laser therapy has gained acceptance [10,11]. We report a case of extensive urethral hemangioma treated successfully with single-stage, endoscopic potassium titanyl phosphate (KTP/532; LaserScope, San Jose, CA) laser photoirradiation.

CASE REPORT

A 7-year-old boy was referred to us with a 2-week history of intermittent bloody urethral discharge and one episode of painful gross hematuria that was exacerbated by crying. The patient had had occasional dysuria but no prior history of hematuria, urethral discharge, or trauma. His mother stated that the boy had a good urinary stream but occasionally had to strain to void when he had dysuria. Furthermore, she had not noted any spontaneous erections in the boy since birth. On examination, the child was noted to have hemangiomas of the penis extending to the scrotum, perineum, and the left buttock. In addition, he had an abnormally large phallus for his age (Fig. 1). The size of the phallus was more consistent with that of a young teenager than a young boy. Laboratory examination revealed normal results of urinalysis, sterile urine, and normal platelet count, leukocyte count, and serum chemistry. However, his hemoglobin value was slightly diminished at 11.5 mg/dL (normal, 12.0–14.0).

Excretory urogram and voiding cystourethrogram were normal with the exception of multiple phleboliths overlying the patient's left hemiscrotum and left upper thigh consistent with the patient's known hemangiomas. Ultrasound examination of the penis showed thickening of the soft tissues consistent with the physical findings of hemangioma. Cross-sectional and longitudinal images of the penis disclosed normal anatomy of the corpora cavernosa. The hemangiomatous soft tissue abnormality appeared to be superficial to the tunica albuginea (Buck's fascia) of the penis (Fig. 2). The cavernosal arteries were well seen

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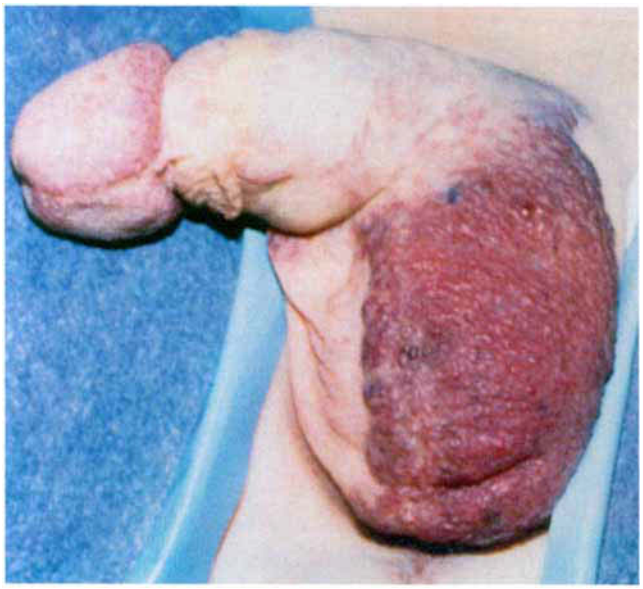

Fig. 1. Hemangiomatous malformation of external genitalia in 7-year-old boy. Note abnormally large phallus.

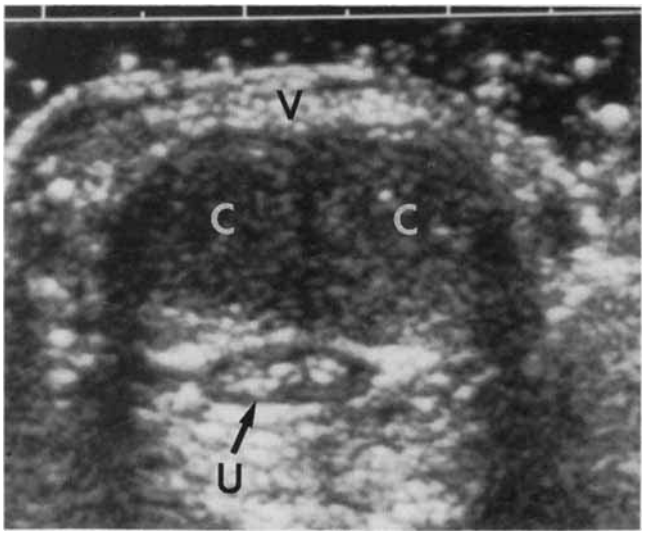

Fig. 2. Ultrasound image of penis, cross-sectional view. Note abundant vascular soft tissue (V) superficial to paired corporeal bodies (C) and urethral lumen (U).

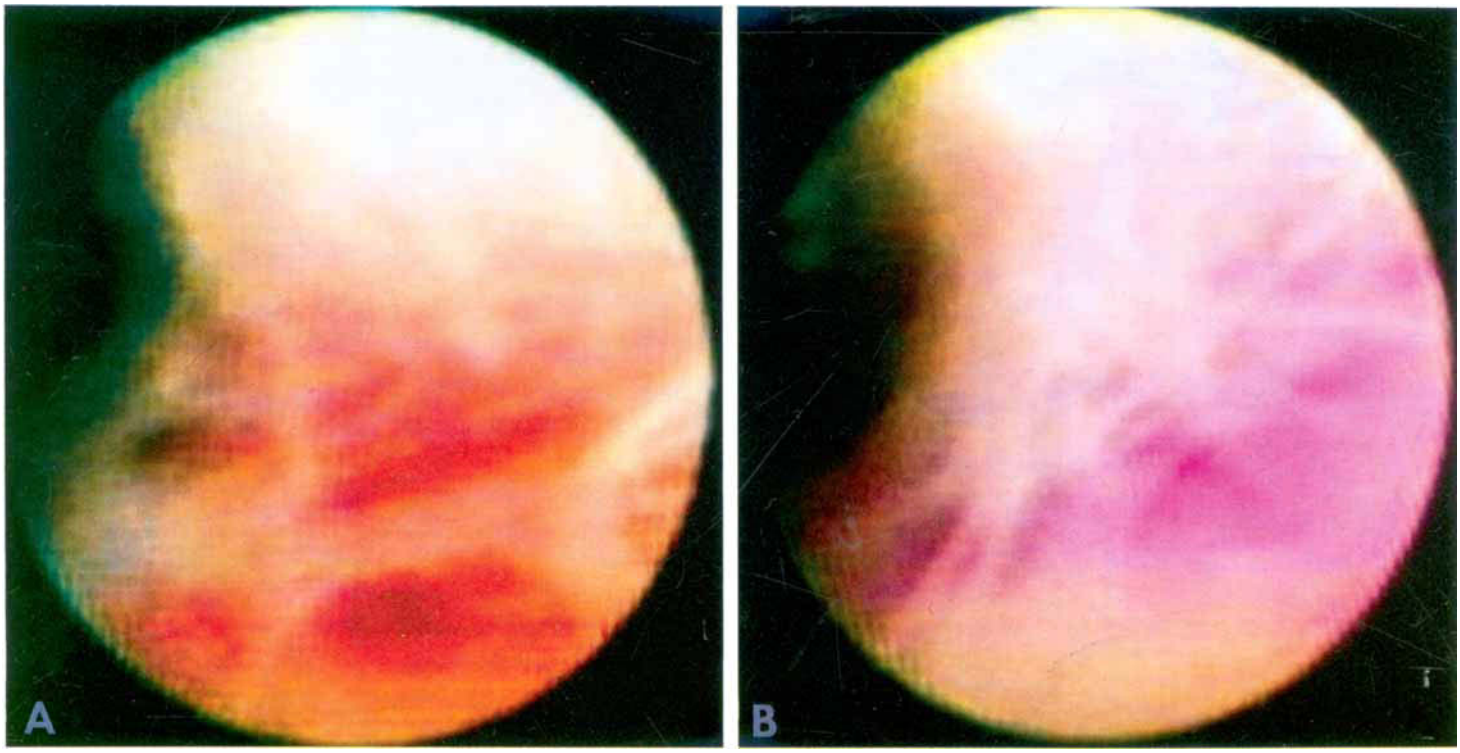

Fig. 3. Urethroscopic appearance of honeycomb-shape urethral hamangioma with little "lakes" of hemorrhagic tissue among trabeculated bands forming the lesion: **A,** before treatment; **B,** blanching of lesion immediately after KTP/532 laser photocoagulation.

anatomically with color, and the Doppler profile showed a normal blood supply.

Cystourethroscopy with the patient under general anesthesia showed a normal bladder and prostatic urethra. Diffusely scattered, nonobstructive hemangiomatous malformation that had a honeycomb appearance extended from the penoscrotal junction to the proximal aspect of the fossa navicularis (Fig. 3A). With use of the KTP/532 laser at a setting of 3 watts delivered contin-

uously through a 600-μm quartz fiber, and under direct vision with a zero-degree cystoscopic lens, the hemangiomatous areas were radiated by near-contact technique for 1–2 seconds until they blanched as a result of thermal coagulation of the submucosal hemangiomatous cavities (Fig. 3B). The procedure was started at the penoscrotal urethra and ended at the fossa navicularis. At its conclusion, a 10-French Foley catheter was placed into the bladder. After removal of the catheter the next morning, the patient voided without difficulty and, to our knowledge, has remained trouble-free for more than 2 years.

DISCUSSION

Hemangiomas are rare, benign tumors arising from embryonic rests of unipotent angioblastic cells and as such can occur anywhere in the body; however, they are unusual in the genitourinary system. When hemangiomas do occur in the genitourinary system, they most commonly appear in the kidney [1]. Urethral hemangioma is rare. It was first described by Klotz in 1895 [12], and since then only 22 additional cases have appeared in the literature [9,11]. Most urethral hemangiomas have been discovered during the third decade of life, but they can present at any age [2,5]. They can vary in size from pinpoint masses to extensive honeycomb-shaped deformities involving the urethra, as noted in our patient.

Genitourinary hemangiomas are often associated with the presence of cutaneous hemangiomas. They may also occur with Klippel-Trenaunay syndrome, a rare condition of soft tissue and bony hypertrophy and various vascular malformations [13]. The abnormalities noted in our patient did not fit the features of this syndrome. Their clinical significance is that they are a source of benign hematuria, sometimes leading to serious hemorrhage requiring transfusion. However, often they produce no signs or symptoms and are found incidentally during cystoscopy or at autopsy. Classically, urethral hemangiomas present with intermittent hematuria or bloody discharge per urethra [2,5,6], as was noted in our patient. It was thought that lack of erections in our patient was probably secondary to an overabundance of incompetent extracorporeal venous plexus. Further evaluation was postponed until subsequent sexual development into the teenage years.

Customary options for treatment of urethral hemangiomas include observation, electrocoagulation, local radium implantation, surgical excision, arterial embolization, and laser ablation [1–11]. It has been suggested that for extensive lesions, open exploration and resection of the involved tissue followed by urethral reconstruction is the best choice of treatment. Others have described ablation of extensive honeycomb-shape urethral hemangiomas with neodymium:yttrium-aluminum-garnet (Nd:YAG) laser in multistaged procedures [10]. Recently, successful use of potassium thiophosphate laser with a wavelength of 532 nm for treatment of localized urethral hemangiomas in three children (two males and one female) was reported [11]. Our experience indicates that endoscopic KTP laser with a wavelength of 532 nm is also a reasonable treatment option in cases of extensive honeycomb-shape urethral hemangiomas. We believe the treatment can be performed safely as a single-stage procedure by a urologist knowledgeable about the tissue effects of 532-nm-wavelength laser. KTP/532 laser energy is well absorbed in hemoglobin and produces less scatter than the Nd:YAG laser and thus less necrosis of the adjacent tissue. These properties are especially important when laser energy is applied to the urethra, and more so to that of a child, with consequently less potential for stricture formation. It is conceivable that judicious endoscopic application of KTP/532 laser energy may obviate open surgical intervention in most, if not all, cases of extensive and symptomatic urethral hemangiomas. In view of these observations, KTP/532 laser therapy should be considered the first line of therapeutic defense.

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